

**Device for holding a transversal rod supported by supporting arms**Field of the invention

The invention relates to a device for holding a transverse rod supported by at least  
5 two supporting arms and intended for suspending hangers, in particular clothes  
hangers. The supporting arms may be hooked into differently configured securing  
means, such as profiled horizontal or vertical rails, grid elements, or plug-in sleeves  
arranged at specific points. The hangers are provided for suspending articles,  
in particular items of clothing, and can be freely displaced on the transverse rod.  
10 Such devices are typically employed on display walls or permanently installed or  
mobile goods racks in stores.

Prior art

A device of the generic type relevant here is disclosed in its simplest form in the  
15 company catalog "Manual A", p. 90, issue 01.02, of Visplay-Group, CH-4127 Birs-  
felden/Switzerland. A transverse rod is permanently arranged, for example welded,  
between two supporting arms which can be hooked into rear securing means,  
resulting in a U-shaped frame. This structure is suitable only for certain applica-  
tions and has the disadvantage of very limited freedom of design owing to the rigid  
20 frame. Corresponding frames have to be manufactured for different spans and for  
the variously configured supporting arms with their numerous connecting pieces.

The company catalog "Manual R", p. 63, issue 01.02, of Visplay-Group, CH-4127  
Birsfelden/Switzerland describes a device in which an eye-shaped receptacle for  
25 the transverse rod is provided at the front end of the supporting rod, this end  
projecting into the room. The inserted transverse rod is secured by providing the  
eye with a radially oriented threaded bore for a clamping screw, the tip of which  
screw bears on the outer circumferential surface of the transverse rod in the  
assembled state. This device has a number of disadvantages; first, the transverse  
30 rod has to be virtually threaded into the eye, an operation which may be compli-  
cated and requires freedom to maneuver especially when the rods are relatively  
long. The screw which is present for securing the pushed-in transverse rod is  
relatively small in its dimensions. The screw could get lost, and the threads are

sensitive. Furthermore, a tool is required for the difficult screwing operation. Finally, the eye which encloses the transverse rod constitutes a lateral limitation. As a result, hangers moved along the transverse rod hit against the eye and are not freely displaceable along the whole length of the transverse rod, which usually  
5 extends laterally beyond the supporting arms. It is thus necessary to lift the hangers over the eye.

"Manual A", p. 106, above, features a device in which retaining pins directed toward the supporting arms to be mounted are screwed onto the traverse rod. A  
10 supporting arm is pushed axially onto each fitted retaining pin and secured by means of screws. Although this device allows hangers hung onto the transverse rod to be freely slid over and beyond the points of connection with the supporting arms, the construction and assembly involve a considerable amount of effort. The transverse rods must be provided with fastening holes and the retaining pins must  
15 be configured in accordance with the cross-sectional profile of the supporting arms and fastened.

#### Object of the invention

In view of the shortcomings of pre-existing devices for holding a transverse rod supported by at least two supporting arms, the object on which the invention is  
20 based is to simplify the connection means for the detachable fastening of an inserted transverse rod to the supporting arms. It is a prerequisite here that suspended hangers are freely displaceable on the transverse rod over and beyond the docking point between the transverse rod and the supporting arms. Requirements here are uncomplicated handling during installation of a transverse rod,  
25 secure and rotationally stable locking of an inserted transverse rod, fulfillment of esthetic aspects and, finally, little outlay on materials and manufacture in order to maintain low production and assembly costs during serial production. Lastly, it should be possible to realize the device for differently configured supporting arms  
30 and securing means which receive them, such as profiled horizontal or vertical rails, supports comprising grids, or plug-in sleeves arranged at specific points. The supporting arms should preferably have a connecting piece which can be fixed detachably in the securing means.

### Overview of the invention

The device concerns a detachable securing means for a transverse rod supported by at least two supporting arms. The supporting arms are fixed detachably or permanently in a supporting structure by way of their first end. The transverse rod is intended for suspending hangers, in particular clothes hangers, the hangers serving for suspending articles, primarily items of clothing, and being freely displaceable on the transverse rod. Connection means for receiving the transverse rod are arranged at the second end of each supporting arm, this end projecting into the room. The connection means is of fork-shaped design with an opening for receiving the cross section of the transverse rod, the transverse rod being partially enclosed while being clamped.

The features below relate to specific embodiments of the invention: the connection means comprises first of all an adaptor which is attached to the second end of the supporting arm or is integrally formed thereon, for example by welding, machining or non-cutting shaping. The connection means further comprises an insert which is to be fitted onto the adaptor, the insert producing elastic clamping forces, consisting of elastic material, for example polycarbonate, and/or being provided with spring elements. The supporting arm may, for example, consist of cross-sectionally round, tubular or flat material. The insert has, extending over the upper region, an opening with a span which, when inserting the transverse rod, first widens and then narrows again, whereby an inserted transverse rod is supported from below while being clamped. The insert extends radially over more than half the circumference of the transverse rod.

The adaptor comprises a basic body and possesses first of all an arcuate cutout with a through-passage direction situated transversely to the supporting arm and axially to the secured transverse rod. An upwardly extending prong passing round the cutout extends one on each side of the cutout. A continuing lug is provided at each of the free, upper ends of the prongs, the lugs being directed toward one another and into the cutout. The insert is an element of half-shell shape in principle. It possesses two ends which project into the room and leave between them

an opening. A curved inner face and a curved outer face are present on the insert. A groove which extends circularly on the outer face and terminates at a distance in front of the ends is intended for partially receiving the adaptor. An aperture is situated at each of the terminations of the groove and is intended for the engagement of the lugs.

The lugs on the adaptor are arranged in principle at a distance which corresponds to the diameter of the traverse rod. Thus, in the assembled state – with insert included – a transverse rod inserted into the adaptor comes to lie in a clamped-in manner between the lugs, as a result of which the transverse rod is secured to a sufficient extent against rotation. A groove is formed at the bottom of the cutout of the adaptor, while a raised rib runs in the groove of the insert and, when the insert is fitted on, comes to lie in the groove in the adaptor.

Alternatively, the connection means comprises a pincer element arranged at the second end of the supporting arm, this pincer element having at least two mutually opposite jaws which are movable elastically in relation to one another and which leave an opening at the top for the insertion of the transverse rod. When inserting the transverse rod, the pincer element first widens and then narrows again. The elasticity of the pincer element is based on the use of elastic material or the arrangement of a spring element between the jaws or on the arrangement of an elastic extension on at least one jaw. With the transverse rod inserted, the jaws of the connection means support the transverse rod radially from below over more than half of its circumference.

In a further alternative, the connection means comprises a pincer element arranged at the second end of the supporting arm, the pincer element having a fixed jaw and, situated opposite the latter, a spring-mounted jaw with an action in the direction of the fixed jaw, an opening for the insertion of the transverse rod again being present between the two jaws. The spring-mounted jaw first moves away from the fixed jaw when inserting the transverse rod, the opening widening as a result. Finally, the spring-mounted jaw moves toward the fixed jaw again, thereby narrowing the opening.

In another alternative, the connection means comprises a pincer element arranged at the second end of the supporting arm, this pincer element having a fixed jaw and, situated opposite the latter, a movable jaw which is able to be fixed in position, an opening for the insertion of the transverse rod being present once more between the two jaws. The movable jaw can first move away from the fixed jaw when inserting the transverse rod, with the result that the opening widens at first. Finally, the movable jaw can move again toward the fixed jaw, the opening narrowing as a result. Means are provided for fixing the movable jaw in position when it is in the end position. In the case of the two additional alternatives, too, with the transverse rod inserted, the jaws of the connection means support the transverse rod radially from below over more than half of its circumference.

The supporting structure comprises, for example, a panel wall mounted permanently in a building, or a self-supporting stand, having securing means mounted thereon. Examples of preferred securing means are profiled horizontal or vertical rails and plug-in sleeves arranged at specified points. The supporting arms are provided at the first end with a connecting piece which is intended to be detachably fastened in the securing means. A circular cross section is preferred for the transverse rods. However, they could also have a roundish cross-sectional shape which tapers above a maximum width.

#### Brief description of the appended drawings

In the drawings:

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figure 1A shows a panel wall with two vertical rails fitted on, with supporting arms hooked into these rails and with a transverse rod supported in the lower arm plane by two supporting arms, in perspective view;

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figure 1B shows a mobile stand equipped with multiple fittings, inter alia with vertical rails, with supporting arms hooked into these rails and with a transverse rod supported by these supporting arms, in perspective view;

- figure 2A shows a supporting arm of a first embodiment with a tubular rod section, with an adaptor attached to its second end and with a connecting piece attached to the first end, in perspective view;
- figure 2B shows the enlarged detail X2 from figure 2A;
- 5 figure 3A shows an insert in perspective view;
- figure 3B shows the insert according to figure 3A from another perspective;
- figure 3C shows the insert according to figure 3A from yet another perspective;
- 10 figure 4 shows a transverse rod in perspective view;
- figure 5A shows the supporting arm according to figure 2A with the insert brought up close to the adaptor, in perspective view;
- figure 5B shows the arrangement according to figure 5A with the insert fitted in the adaptor;
- 15 figure 5C shows the enlarged detail X3 from figure 5B;
- figure 6A shows a supporting arm of a second embodiment with a flat rod section, with an adaptor attached to its second end and with a connecting piece attached to the first end, in perspective view;
- 20 figure 6B shows the arrangement according to figure 6A with the insert fitted in the adaptor;
- figure 7A shows the supporting arm according to figure 5B with the transverse rod brought up close to it, in side view;
- 25 figure 7B shows the arrangement according to figure 7A with the transverse rod fitted;
- figure 7C shows the enlarged detail X4 from figure 7B;
- figure 8A shows the enlarged detail X1 from figure 1A; and
- 30 figure 8B shows the arrangement according to figure 8A in a changed perspective.

#### Exemplary embodiment

- 35 What follows below is the detailed description of an exemplary embodiment per-

taining to the device according to the invention by means of two supporting structures which differ in principle and two configured supporting arms and to the components used therein.

5 Figure 1A

Two vertical rails 2 spaced apart parallel to one another are mounted on a panel wall 1 which could be fixed permanently to part of a building. These vertical rails 2 are each equipped with two supporting arms 3 in an upper, first, plane and a lower, second, plane. One supporting arm 3 of the upper plane is stepped, while  
10 the adjacent supporting arm 3 extends straight into the room; both are unoccupied. The two supporting arms in the lower plane extend straight and secure the horizontally applied transverse rod 7 of round cross section in each case in an adaptor 5 and an insert 6 which are arranged at the front of the supporting arms 3. The adaptor 5 with the insert 6 together form a detachable connection means 5,6.  
15 The transverse rod 7 clamped therein bridges the gap between the two supporting arms 3 and extends beyond them on both sides. The supporting arms 3 are hooked into the vertical rails 2 by way of their connecting pieces 4. The panel wall 1 and the vertical rails 2 fitted thereon form the supporting structure 1,2 for the device according to the invention.

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Figure 1B

Alternatively, the supporting structure 1,2 is formed by a mobile stand 1 and vertical rails 2 directed upwardly therefrom. The vertical rails 2 are arranged in pairs so that they can be fitted out on both sides. Supporting arms 3 hooked into  
25 the vertical rails 2 again secure a transverse rod 7 resting on adaptors 5 and inserts 6 while being clamped in.

Figures 2A and 2B

The first embodiment of the supporting arm 3 has on its tube section a first end 31  
30 and a second end 30, the connecting piece 4 being arranged at the first end 31, while the adaptor 5 is situated at the second end 30, the adaptor being attached or integrally formed, for example, by welding, machining or non-cutting shaping. In the example shown here, the adaptor 5 comprises an attached basic body 50

which is flat in principle and which has an upwardly open, arcuate cutout **51** with a through-passage direction **R** situated transversely to the supporting arm **3**. An upwardly extending prong **54** passes round on both sides of the cutout **51**, the prongs being provided at their free upper ends with lugs **52** which are directed  
5 toward one another and into the cutout **51**. The lugs **52** leave between them the distance **d** which corresponds to the diameter of the transverse rod **7**. The groove **53** is present at the bottom of the cutout **51**.

#### Figures 3A to 3C

10 The insert **6** to be fitted onto the adaptor **5** consists of elastic material, for example polycarbonate, and has in principle the shape of a half-shell which extends over more than 180° and has an upwardly situated opening of span **a** between the two ends **60,61** projecting into the room. Also provided on the insert are a curved inner face **63** and a curved outer face **64**, a circularly extending groove **65** being  
15 present on the outer face and terminating at a distance in front of the ends **60,61**. An aperture **62** is present at each of the terminations of the groove **65**. A raised rib **66** runs in the groove **65**.

#### Figure 4

20 The transverse rod **7** is formed by a straight tube section of diameter **d** which has a first end **70** and a second end **71**. Upwardly projecting limit elements **72** are provided at both ends **70,71** so as to prevent hangers hung onto the transverse rod **7** from falling down.

#### Figures 5A to 5C

25 In the supporting arm **3** having the connecting piece **4** present at the first end **31** and the adaptor **5** mounted at the second end **30**, the formation of the connection means is completed by plugging the insert **6** onto the adaptor **5**. In the assembled state, the insert **6** comes to lie in the cutout **51** of the adaptor **5**, the latter being  
30 partially received in the groove **65** of the insert **6**. The lugs **52** of the adaptor **5** engage through the apertures **62** of the insert **6**, and the rib **66** rests in the groove **53** in the adaptor. The upwardly projecting ends **60,61** of the insert **6** leave between them an opening with the span **a** for receiving the transverse rod **7**.



Figures 6A and 6B

Alternatively, a supporting arm 3 of a second embodiment may comprise, instead of a tube section, a strut made of flat material and having the adaptor 5 integrally formed at its second end 30, this adaptor having identical contours to the adaptor 5 on the supporting arm 3 of the first embodiment according to figure 2A. A connecting piece 4 for hooking into a securing means 2, for example a horizontal rail, is again provided at the first end 31 of the flat supporting arm 3.

Figures 7A to 8B

This sequence of figures illustrates the insertion of the transverse rod 7 into the connection means formed by the adaptor 5 and insert 6 and having the upwardly directed fork-shaped opening for partially enclosing the cross section of the transverse rod 7 with clamping. When the transverse rod 7 is pressed into the opening of the insert 6 with the span  $a$ , its two ends 60,61 spread out as soon as a cross section of the transverse rod 7 which is greater than the span  $a$  comes to lie between the ends 60,61. With the transverse rod 7 fully latched into place, the two ends 60,61 of the insert narrow again above the diameter  $d$  of the transverse rod 7, with the result that more than half of the circumference of the transverse rod 7 is supported radially from below by the insert 6.

The transverse rod 7 is secured in the upward direction by virtue of the elasticity of the insert 6 and can only be removed from the connection means 5,6 if a pull-out force is applied to overcome the clamping effect of the insert 6. The inserted transverse rod 7 is secured against rotation as a result of the lugs 52 of the adaptor 5 coming to lie with a clamping action on the outer circumference of the transverse rod 7. This ensures that a stable rotary position is maintained for the transverse rod 7 and that the limit elements 72 possibly present at the rod ends 70,71 remain in the outwardly directed position. An inserted transverse rod 7 is held at least by two supporting arms 3 and, depending on the lateral loading, may have its ends 70,71 extending in a corresponding width beyond the connection means 5,6.